



# Towards a Resilient Seattle

## Pre-Disaster Recovery Planning in Seattle

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# Resilience

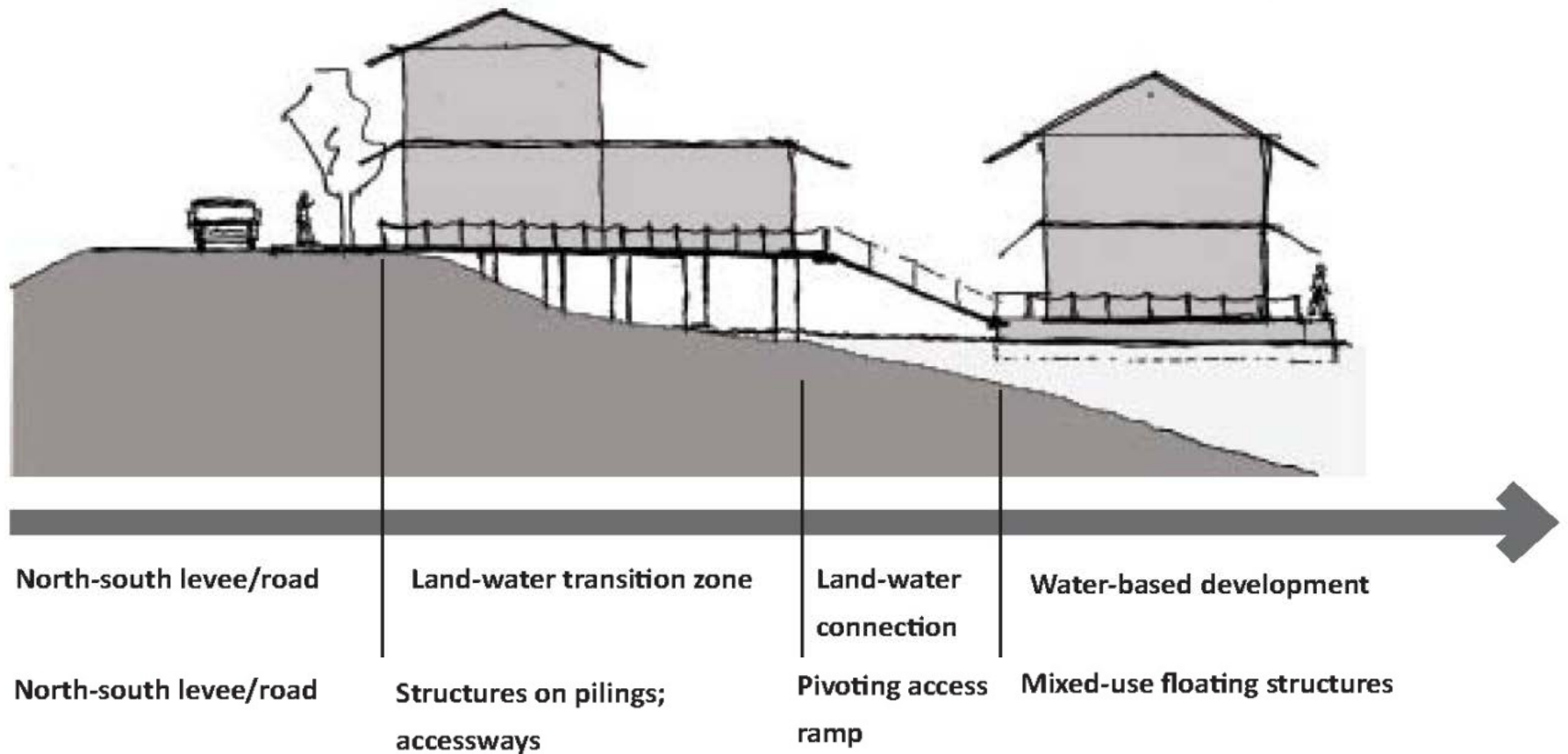
A framework for planning in the 21<sup>st</sup> Century



It's more than just climate change!

Climate change  
Earthquake  
storm  
outage  
Floods  
Tsunami  
Water  
Lahar  
Pandemic  
Fires  
Seiches  
Civil  
Power  
Snow  
Wind  
shortages  
Terrorism  
Incidents  
Transport  
Volcano  
Heat  
Excessive  
Landslides  
disorder

# Plan for variability – not constancy!



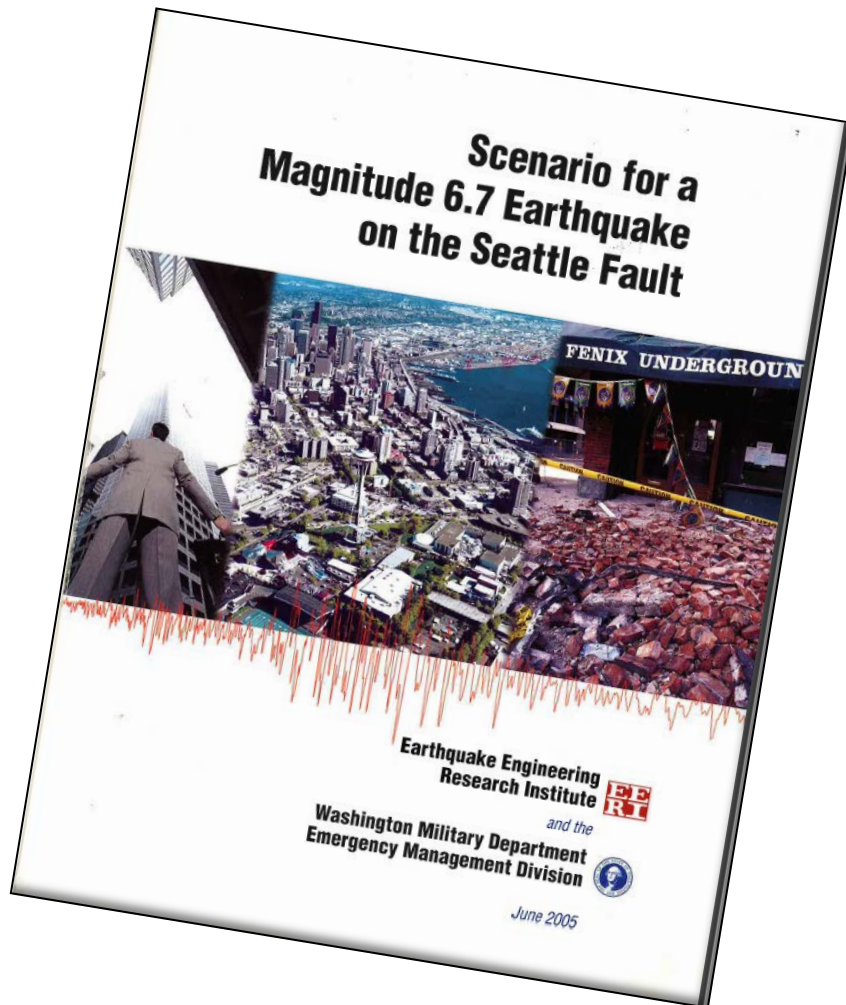
# Resilience applies to all land use

- ❑ Resilience as a framework for real sustainability
- ❑ Join land use planning with infrastructure planning
- ❑ Multi-scale solutions/strategies for better adaptation, resilience to extreme events
- ❑ Blend smart design with smart semi-autonomous districts
- ❑ Encourage solutions with multiple benefits instead of sector-only benefits

# Resilience in all planning areas

- Shoreline planning
- Comprehensive plan updates
- Neighborhood plan updates
- Transit Oriented Development
- Disaster mitigation planning
- Campus planning
- Master planned developments
- Utility/infrastructure planning
- Climate change strategies
- Capital planning (10-year CIP)

# SEATTLE EARTHQUAKE SCENARIO 6.7M



## SEATTLE EARTHQUAKE SCENARIO 6.7M (Created in 2005)

\$33 billion in damage

1,600 deaths

24,200 injured

29,000 buildings severely damaged

154,500 buildings moderately damaged

Port facilities badly damaged

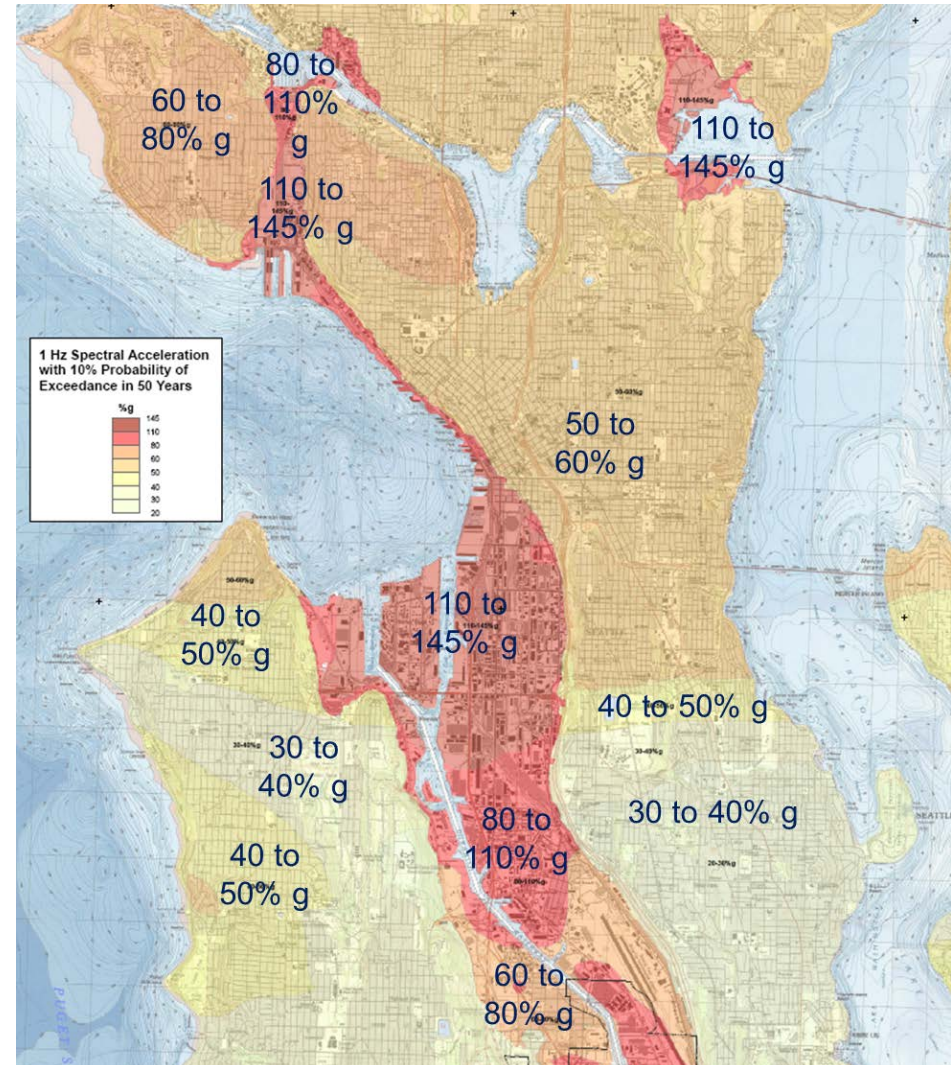
Partial closures on all 6 major highways

130 fires



# MANY OF SEATTLE'S JOBS AT RISK

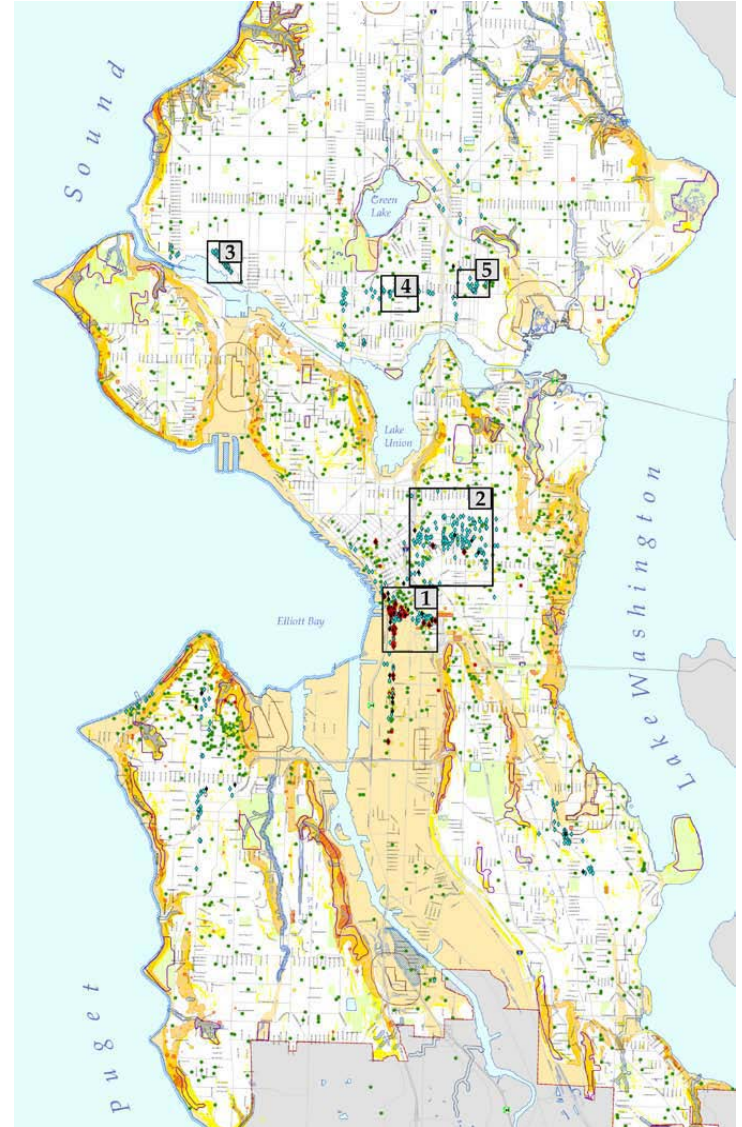
- Many of Seattle's jobs in red zone
- One-in-ten chance in the next 50 years
- Accelerations of up to 145% gravity
- Current code is 40% gravity but probably performs near 80% gravity





# UNREINFORCED MASONRY BUILDINGS ARE AT RISK

- Over 1,000 unreinforced masonry buildings





## Travelers Face a Nightmare

Storm Cripples Subways, Flights and Rail; Repairs Could Take Days or Longer

Sandy struck the most people: AMR Corp.'s American Airlines, which had the most flights canceled, according to the airline.

## AFTER THE DEVASTATION, A DAUNTING RECOVERY



### IMPACT OF A STORM

## Wind-Driven Flames Reduce Scores of Homes to Embers in Queens Enclave

By SAM DOLNICK and COREY KILGANNON

The flooded streets formed a barrier across the flames, which were driven by the wind.

## Power Outages May Last More Than a Week

### Vulnerabilities in the Grid

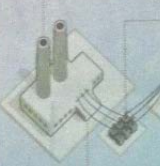
#### Typical power grid system:

**Power plant**  
Constantly generates enough electricity to meet demand since power cannot be stored.

**Step-up transmission substation**  
Transformers increase the voltage so that large amounts of power can be moved.

**Distribution substation**  
Located near the end users. Voltage is lowered again.

**Pole transformer**  
Reduces voltage for home and office use: 120-240 volts.



Weaknesses exposed

## After Getting Back to Normal, Big Job Is Facing New Reality

By N. R. KLEINFELD

First, life has to be rewound. Friday, Oct. 26 — the last day before Hurricane Sandy.

HEN ARRO, again and e, scientists ate officials

### IMPACT OF A STORM

## A Slow Return to Normalcy Doesn't Mean Filling the Gas Tank Is Any Easier

By ELIZABETH A. HARRIS

## With \$200 Million in U.S. Housing Aid, Officials Begin Relocating the Displaced

This article is by James Baran, Eric Lipton and Ray Rivera.

Officials said they were working on Monday to provide temporary housing for people displaced by Hurricane Sandy despite confusion and conflicting accounts of how many needed places to live.

"We don't really know yet, in

connected, thousands of people could not simply return to houses that had sustained serious damage and needed major work.

"As power comes on, it's coming clear for many people longer-term issue will be finding and repairing their homes," said W. Craig Fugate, administrator of the Federal Emergency Management Agency.

## Schools Reopen to Snarls, and Transit Headaches Persist

Communication and coordination

## Fractured Recovery Divides a Frustrated Region



# Seattle Pre-Disaster Recovery Plan: Phase 1

- Background research
- Case studies
- Four “focus groups” with more than 60
- Identified
  - Shared values
  - Issues and strategies
- Developed Recovery Plan concepts
- Decision-making processes
- Draft scope of work for Phase 2

# RECOMMENDED STRATEGY

1. Augment social/community connectivity
2. Connect disaster professionals
3. Keep the money flowing
4. Develop resilience messaging
5. Integrate resilience into city plans
6. Consult and inform
7. Build multi-scale resilience into centralized systems
8. Use shared values to guide recovery

# USE SHARED VALUES TO GUIDE RECOVERY

- Equity and Diversity
- Neighborhood Ownership
- Innovation
- Participation and Communication
- Environmental Quality
- Economic Vitality
- Independence and Individuality
- Mobility
- Resilience and Sustainability
- Civil rights and liberties

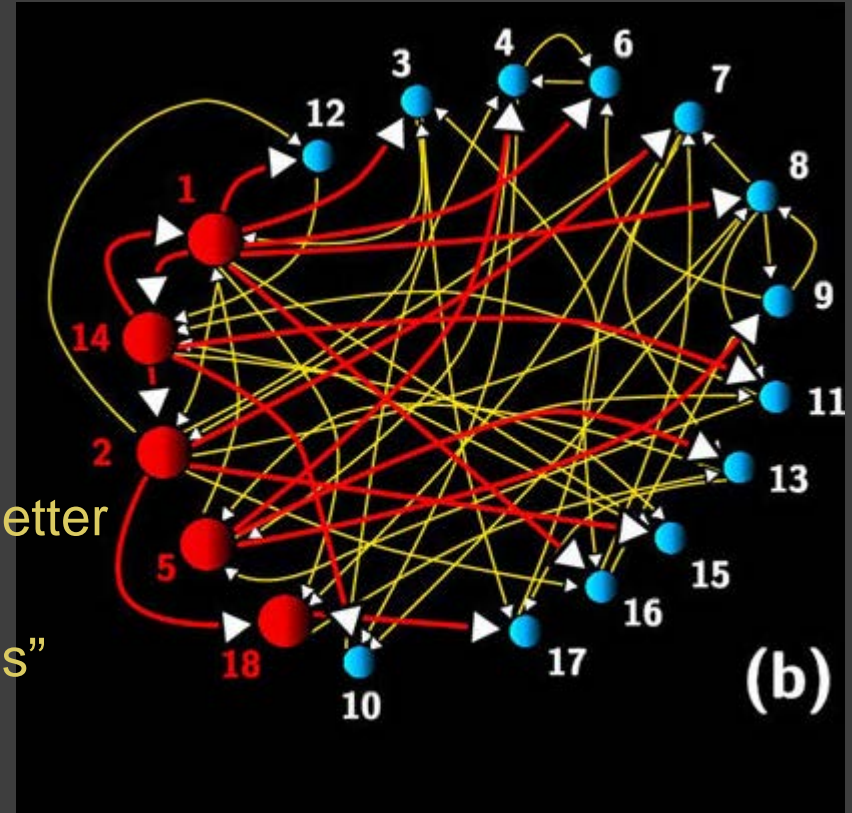
# RECOVERY TAKES THE WHOLE COMMUNITY

- After a major disaster, many organizations will ask themselves: “What can we do to help?”
- Help will be needed because
  - Governments are overwhelmed
  - Federal funds do not cover all losses
  - Insurance does not cover all losses
- If we plan for recovery we can:
  - Build back stronger
  - Bring everyone along
  - Avoid lost time and unnecessary conflict
  - Start work *before a disaster* that makes us all more resilient

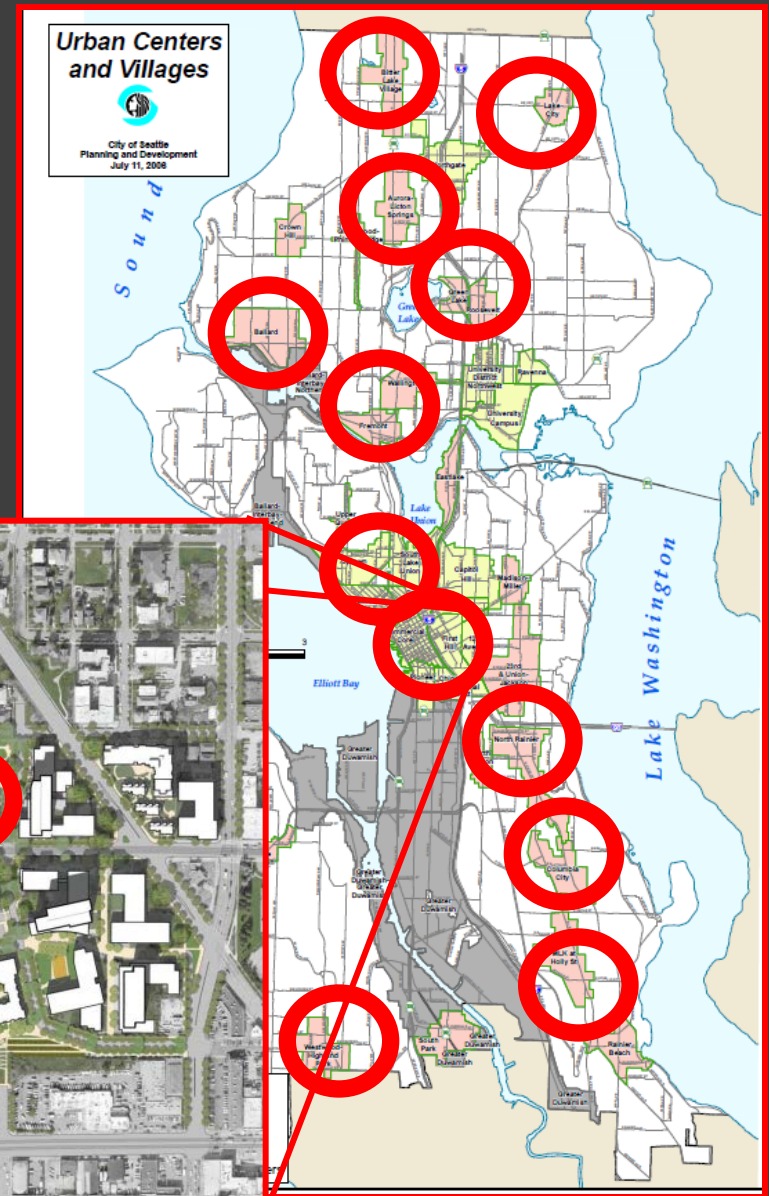


# BUILD ON SOCIAL RESILIENCE

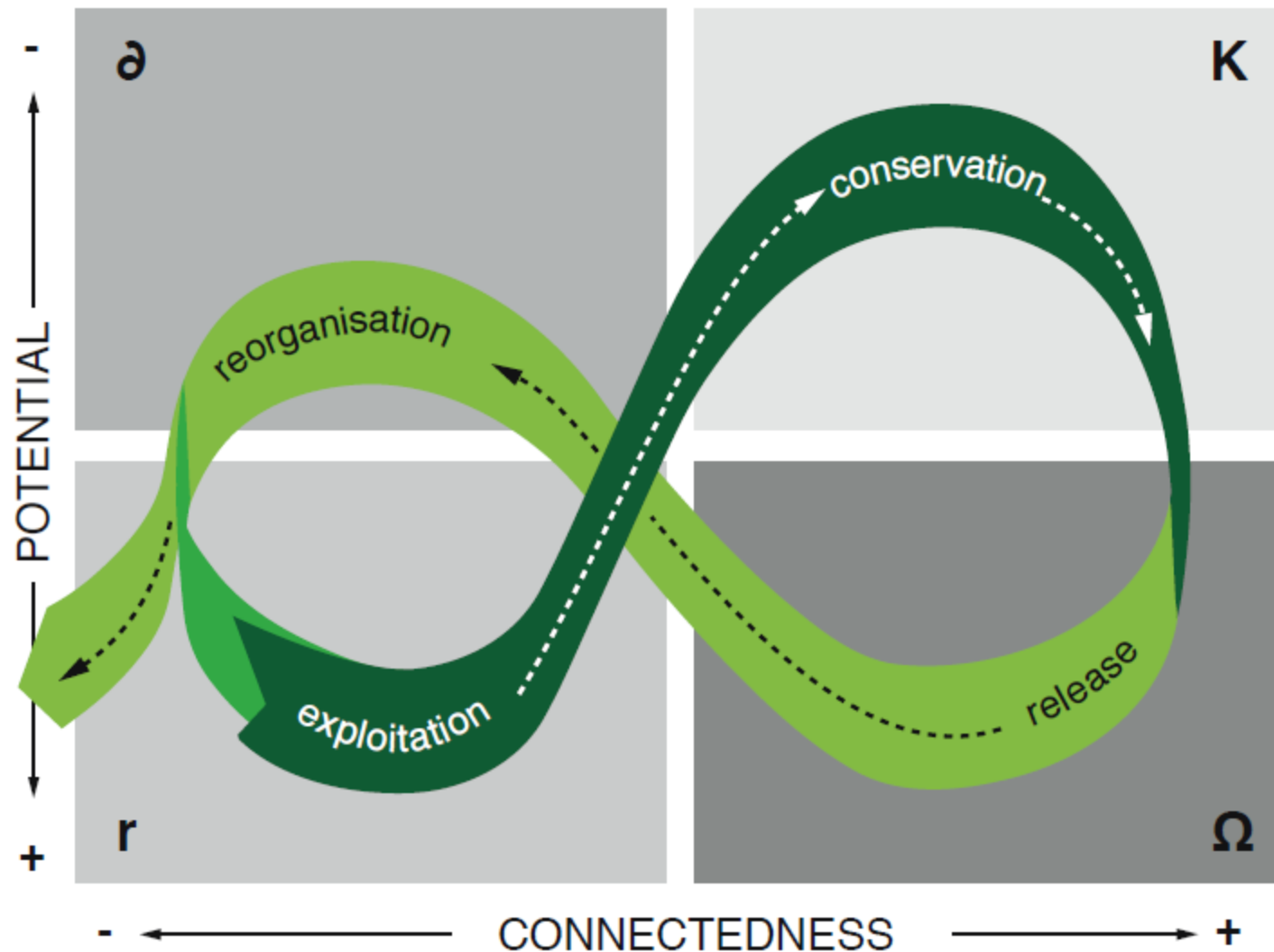
- Self-reliant “survivors”
  - Hopefulness
  - Positive ability to cope
  - Capable
  - Adaptable
  - Think of recovery as a chance to rebuild to be even stronger and better than ever.
  - Do not see themselves as “victims”
- Strong social connections
- “Trusted relationships” in advance
- Strong sense of community



**Nest green buildings**  
into green neighborhoods  
to make resilient cities  
to make resilient regions



# RESILIENCE: FLOURISHING WITH CHANGE



# Thank you!

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